WHAT IS CLAIMED IS:

1. A method for optimizing an illumination condition of a lithographic apparatus by computer simulation using isofocal compensation, the lithographic apparatus comprising an illuminator configured to provide an illumination arrangement, a projection system and a mask having at least one pattern to be printed on a substrate, the method comprising:

defining a lithographic pattern to be printed on the substrate;

selecting a simulation model;

selecting a grid of source points in a pupil plane of the illuminator;

calculating separate responses for individual source points, each of the responses representing a result of a single or series of simulations using the simulation model;

calculating a metric representing variation of the separate responses for individual source points with defocus; and

adjusting an illumination arrangement based on analysis of the metric.

2. A method according to claim 1, wherein calculating the metric comprises:

applying a defocus;

calculating separate defocus responses for individual source points at the defocus, each of the defocus responses representing a result of a single or series of simulations using the simulation model; and

comparing the separate responses with the separate defocus responses for individual source points.

3. A method according to claim 2, wherein the comparing comprises determining separate metric responses for individual source points.

4. A method according to claim 3, wherein the separate metric responses correspond either to an augmentation of the value of the defocus response or a diminution of the value of the defocus response.

5. A method according to claim 3, wherein the determining comprises subtracting the separate defocus responses from the separate responses for individual source points.

6. A method according to claim 3, wherein the adjusting comprises mapping the metric responses as a function of individual source point positions.

7. A method according to claim 4, wherein the adjusting comprises selecting an illumination arrangement capturing source points having opposite metric response behaviors.

8. A method according to claim 1, wherein the defocus is within a range from 0.02 to 0.4μm.

9. A method according to claim 1, wherein selecting a simulation model comprises selecting one of a full resist model, an aerial image model, a lumped parameter model and a variable threshold resist model.

10. A method according to claim 9, wherein the resist model is a calibrated model capable of adequately predicting experimental results.

11. A method according to claim 9, wherein the resist model includes defining a resist model taking into account at least one of vector effects, non-zero diffusion of active species, and finite dissolution contrast.

12. A method according to claim 1, wherein the separate responses comprise one of a critical dimension of the pattern and an intensity threshold.

13. A method according to claim 1, wherein the adjusting comprises selecting an illumination arrangement so that the variation of the separate responses is substantially equal to zero through defocus.

14. A method according to claim 1, further comprising calculating other separate responses for individual source points, each of the other responses representing a result of a single or series of simulation using the simulation model.

15. A method according to claim 14, wherein the adjusting comprises adjusting an illumination arrangement based on analysis of the other separate responses.

16. A method according to claim 14, wherein the other responses comprise one of exposure latitude, depth of focus, E1:1, dense to isolated features bias, arbitrary feature biases, sidelobe printing, film loss, sidewall angle, mask error enhancement factor, linear resolution and absolute resolution.

17. A method according to claim 14, further comprising mapping the other separate responses as a function of individual source point positions.

18. A method according to claim 1, further comprising mapping the variation of the separate responses as a function of individual source points positions.

19. A method according to claim 1, wherein a spacing of the source point in the grid is within a range from 0.01 to 0.2 .

20. A method according to claim 1, wherein adjusting the illumination arrangement includes adjusting illumination arrangement by varying a position of an axicon/zoom module relative to a pyramidal prism, a position of a diffractive optical element, a position of an aperture blade, or by adjusting a programmable mirror array.

21. A method according to claim 1, wherein adjusting the illumination arrangement includes selecting a multipole illuminator arrangement.

22. A lithographic projection apparatus comprising:

an illumination system to provide a projection beam of radiation

a support structure to support patterning structure which can be used to pattern the projection beam according to a desired pattern;

a substrate table to hold a substrate;

a projection system to project the patterned beam onto a target portion of the substrate;

a processor to define a lithographic pattern to be printed on the substrate, to select a grid of source points in a pupil plane of the illumination system, to calculate separate responses for individual source points, each of the responses representing a result of a single or series of simulations using a simulation model, to calculate a metric representing variation of the separate responses for individual source points with defocus; and to calculate an optimized illumination arrangement based on analysis of the metric; and

a selectably variable beam controller that is adapted to modify a cross-sectional intensity distribution in the projection beam exiting the illumination system in accordance with the optimized illumination arrangement calculated by the processor.

23. A machine readable medium encoded with machine executable instructions for optimizing an illumination condition of an illuminator using isofocal compensation according to a method comprising:

defining a lithographic pattern to be printed on a substrate;

selecting a simulation model;

selecting a grid of source points in a pupil plane of the illuminator;

calculating separate responses for individual source points, each of the responses representing a result of a single or series of simulations using the simulation model;

calculating a metric representing variation of the separate responses for individual source points with defocus; and

adjusting an illumination arrangement based on analysis of the metric.

24. A device manufacturing method comprising:

providing a mask; and

projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate, wherein, prior to impinging the mask, a cross-

sectional intensity distribution in the projection beam is optimized using a method according to claim 1.

25. A method according to claim 4, wherein the adjusting comprises weighing the individual source points.